

REMARKS/ARGUMENTS

This paper is in response to the Office Action dated January 4, 2011. In the Office Action, Claims 1-2, 4, 12-13, 16, 18-21, and 24-30 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent Application Pub. No. 2003/0219341 to Dovey et al.; Claims 1-2, 4, 12-13, 16, 18-21, and 24-30 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Dovey in view of U.S. Patent No. 6,176,683 to Yang; Claims 3, 5, 9, 22-23, 26, and 29 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Dovey, or Dovey in view of Yang; Claims 3, 5, 9, 22-23, 26, and 29 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Dovey, or Dovey in view of Yang, further in view of U.S. Patent No. 4,502,842 to Currier et al.; Claims 6-7, 10-11, 14, and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Dovey, or Dovey in view of Yang, further in view of U.S. Patent No. 5,224,835 to Oltman; Claims 6-7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Dovey, or Dovey in view of Yang, further in view of Currier and further in view of Oltman; Claims 8 and 15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Dovey in view of Oltman and further in view of Yang; Claims 8 and 15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Dovey in view of Yang and further in view of Oltman; Claim 8 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Dovey in view of Currier and further in view of Oltman and further in view of Yang; Claim 8 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Dovey in view of Yang and further in view of Currier and further in view of Oltman; and Claim 31 was rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,179,630 to Stuber or U.S. Patent Application Pub. No. 2003/0161734 to Kim in further view of Dovey. In response, Applicant has amended Claims 1, 12, 18, 27, and 30 to further clarify the present invention. The Examiner's further consideration of this application is requested in light of the amendments made above and the following comments.

The present invention generally relates to a fluid pump that performs an initial calibration to maximize piston displacement within the pump's cylinder, which helps minimize collisions

between the piston and the cylinder during normal operation of the fluid pump. As noted above, the Office Action rejects independent Claims 1, 12, 18, 27, and 30 of the present invention under 35 U.S.C. § 102(b) as being anticipated by Dovey.

Dovey generally discloses a vacuum pump incorporating a reciprocating piston for which a vibration sensor is used to control the piston stroke. In particular, Dovey discloses a vibration sensor mounted on a vacuum pump having a piston moving between two ends of a cylinder. If the vibration sensor detects a collision between the piston and either end point of the cylinder, the sensor sends a signal to the pump controller to reduce the drive voltage thereby reducing the piston stroke length. Dovey then continues to monitor the vibration sensor output to detect further collisions during operation of the vacuum pump.

In the Office Action, the Examiner suggested amending the independent claims to claim both the calibration feature and control feature of the present invention, because the references applied appear not to disclose the systems working this way. The Examiner noted that it appears the cited references do not teach the calibration feature of the claims. In response, Applicant has amended the independent claims to capture both of these features of the present invention. Accordingly, Applicant respectfully submits that for at least this reason, the independent claims are now in condition for allowance.

In the Office Action, the Examiner was unable to guarantee that it would not be obvious to modify Dovey to work in this fashion. Applicant submits that it would not be obvious to modify Dovey to include a calibration feature prior to operation. Dovey teaches that reduction in the drive voltage is only required “**should** the end of a piston strike an end plate” (Dovey, col. 2, lines 15-16). Thus, Dovey contemplates embodiments where no collisions occur, and therefore an initial calibration would be extraneous.

Furthermore, Dovey does not teach performing a calibration of the system as recited in the independent claims in the event of a collision, but rather simply teaches reducing the drive voltage should a collision occur. According to Dovey, such a system “provides inherent compensation for mechanical load and power supply variations” (Dovey, col. 2, lines 42-43).

Because Dovey contemplates regular issues arising during operation, Dovey teaches simply reducing the drive voltage each time they occur. In this way, Dovey does not rely on a true calibration feature but rather a series of temporary reductions in drive voltage in response to commonly occurring issues that result in collisions.

The Office Action further suggested that Dovey teaches storing a maximum voltage which is a representation of the maximum displacement value. Applicant respectfully disagrees. While Dovey appears to disclose reducing a drive voltage when a collision occurs, as described above, there is nothing in Dovey to indicate that any value, such as the reduced drive voltage or the drive voltage at the time of the collision, is ever stored. Applicant has also amended independent Claims 18 and 27 to recite controlling the piston displacement during operation by applying a maximum piston stroke length equal to the stored maximum value. Again, since Dovey does not teach storing a maximum piston displacement value, Dovey further fails to teach or suggest using such a value to control piston displacement during operation. As Applicant noted above, Dovey simply recites detecting collisions during operation due to various issues and reducing the drive voltage each time a collision occurs, which does not require nor rely on storage of a maximum piston displacement value.

For at least these reasons, Applicant respectfully submits that Dovey fails to teach or suggest each and every recitation of independent Claims 1, 12, 18, 27, and 30, as amended. Accordingly, it is submitted that Claims 1, 12, 18, 27, and 30 are patentably distinct from Dovey. For similar reasons, Applicant submits that independent Claim 31, which recites an environment cooler comprising a control system as defined in Claim 1, is further patentable over the cited references.

The Applicant has made significant contributions to the art which are neither taught nor suggested by the cited prior art. Accordingly, it is submitted that the application is now in condition for allowance and such action is respectfully submitted. Should the Examiner have any questions, comments or proposed claim amendments, he is encouraged to contact the undersigned by telephone so that allowance of this application can be expedited.

Appl. No.: 10/596,239
Amdt. dated July 5, 2011
Reply to Office Action of January 4, 2011

The patentability of the independent claim has been argued as set forth above and thus the Applicant will not take this opportunity to argue the merits of the rejection with regard to the dependent claims. However, the Applicant does not concede that the dependent claims are not independently patentable and reserves the right to argue the patentability of the dependent claims at a later date if necessary.

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It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefor (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

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